

Original Article

Success and Complications of Salpingectomy at the Time of Vaginal Hysterectomy

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ABSTRACT **Study Objectives:** To document the success rates and complications of salpingectomy performed at the time of vaginal hysterectomy to possibly reduce ovarian cancer rates.

Design: Retrospective cohort study (Canadian Task Force Classification II-2).

Setting: Community-based hospital with university affiliation in Calgary, Canada.

Intervention: All women undergoing hysterectomy for benign conditions were offered preferentially a vaginal approach with prophylactic salpingectomy.

Measurements and Main Results: During the study period (October 2011 to January 2014), a total of 425 vaginal hysterectomies were performed. The overall success rate of salpingectomy was 88%. Pelvic adhesions significantly predicted the ability to perform salpingectomies (odds ratio, 6.3; 95% confidence interval, 2.8–14.3; $p < .001$). Age also was predictive of outcomes ($p = .007$), with increasing age predicting decrease success. The overall postoperative complication rate was 15%, with 3.8% possibly attributable to salpingectomy (i.e., intrapelvic complications). No associated factors were found on regression analysis.

Conclusion: Salpingectomy at the time of vaginal hysterectomy is a feasible procedure. Complication rates are low. Only pelvic adhesions are associated with failure to complete a salpingectomy. Journal of Minimally Invasive Gynecology (2015) 22, 864–869 © 2015 AAGL. All rights reserved.

Keywords: Surgical outcome; Vaginal salpingectomy

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In the United States, 1.4% of women will develop ovarian cancer, of whom only 45% will live 5 years or longer [1]. There is emerging evidence that epithelial ovarian cancers originate in the fallopian tubes and spread to the ovary [2–4]. This paradigm shift culminated in a clinical practice statement by the Society of Gynecologic Oncology in November 2013 declaring that women of average risk of ovarian cancer undergoing any pelvic surgery should

consider undergoing bilateral salpingectomy [5]. Before this, in September 2011 the Society of Gynecologic Oncology of Canada released a position statement announcing that “due to its cancer potential, physicians discuss the risks and benefits of bilateral salpingectomy with patients undergoing hysterectomy for any indication” [6]. At present, the benefits of prophylactic salpingectomy are not known, but are only theoretical [7]. Thus, there may be an opportunity to decrease the morbidity and mortality of epithelial ovarian cancers by performing bilateral salpingectomy at the time of hysterectomy.

Approximately 600 000 hysterectomies are performed in the United States annually [8]. Hysterectomy is second only to cesarean section as the most commonly performed surgery in women [8]. Vaginal hysterectomy is the preferred route of hysterectomy for benign conditions [9]; however, adding the complexity of salpingectomy might increase

Funding was provided by the Leadership Circle, Department of Obstetrics and Gynecology, University of Calgary. The authors report no conflict of interest.

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Submitted March 4, 2015. Accepted for publication April 12, 2015.

Available at www.sciencedirect.com and www.jmig.org

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<http://dx.doi.org/10.1016/j.jmig.2015.04.012>

morbidity to an unknown degree. Previous investigators have looked at selected groups of women, often with the addition of concomitant oophorectomy [10–12]. In 2013, Frishman [13] stressed the importance of considering prophylactic salpingectomy at the time of hysterectomy. This was followed by another editorial published in the *American Journal of Obstetrics and Gynecology*, in which the author stated that “patients need to be aware of the potential risks and benefits” of adding a salpingectomy and concluded by requesting more cohort studies to clarify the risks [14].

The objectives of the present study were to document the success rates and complications of performing salpingectomy in all women undergoing vaginal hysterectomy for a benign condition. Factors that may be associated with failure to successfully complete salpingectomies were explored as well.

Materials and Methods

This was a retrospective chart review of all hysterectomies performed between October 1, 2011 (following the Society of Gynecologic Oncology of Canada recommendations) and January 31, 2014. All women undergoing hysterectomy were offered prophylactic salpingectomy during this time period. Salpingectomy was not performed routinely before this. All surgeries were performed in a community teaching hospital in Calgary, Canada. The surgeries were done or supervised by 2 senior surgeons (D.C. and S.I.), whose primary choice of surgery was a vaginal approach. As such, they were experienced vaginal surgeons. Surgeries were also performed by residents with different levels of training.

Data were extracted from clinic and hospital charts from the date of admission for the hysterectomy until the 6-week follow-up clinic visit. All women undergoing hysterectomy for a benign condition were included. One surgeon used the Baden-Walker prolapse grading system [15], and the other used the pelvic organ prolapse quantification system (POP-Q) [16]. These systems were combined by dichotomizing the prolapse into greater than or equal to grade 2 (Baden-Walker) or stage 2 (POP-Q). Although these are not equivalent prolapses, it was felt that both would have an impact on uterine mobility. The pathology was investigated not in accordance with the standards for looking for carcinoma with at least 3 mm [17], but rather initially grossly inspected with a representative section for microscopic evaluation, as is the standard for reporting suspected benign pathology.

Once entry into the peritoneal cavity was secured, vaginal hysterectomy was carried out with the LigaSure Max Reusable Hand Switching Instrument (Covidien, Boulder, CO). The uterus was morcellated or cored (if necessary) after the uterine vessels were sealed. The mesosalpinx was sealed with the LigaSure instrument flush to the fallopian tube. The mesosalpinx was then cut before release of the Ligasure instrument. Bowel was carefully packed away from the field

with a tagged sponge. If accessing the tubes proved difficult, they were grasped with a sponge forceps or long Kelly forceps and removed in portions or intact. In many cases, gently grasping the ovary and moving it improved accessibility to the tubes. The tubes were frequently removed with the uterus after securing and releasing the round ligament, rather than cutting the tube at the cornua and then removing it. If a woman required or requested an oophorectomy, this was performed concomitantly.

Descriptive analysis was used to describe the study cohort and the success and complications of salpingectomy. Linear regression was performed to explore associations with the success of salpingectomy, with odds ratios (ORs) and 95% confidence intervals (CIs) reported for binary outcomes and R^2 reported for continuous variables. Patients with missing demographic data were not included in the regression analysis for that factor. Variables examined included age, body mass index (BMI), any previous pelvic/abdominal surgeries, parity, mode of delivery (including cesarean section), prolapse, and concomitant oophorectomy. Although the study institution was a teaching hospital, the retrospective nature of the study did not allow us to identify the primary surgeon performing the salpingectomy. All data were analyzed using Stata version 9 (StataCorp, College Station, TX). A p value $<.05$ was considered significant. The study was approved by the Conjoint Health Research Ethics Board (study ID: REB13-0824).

Results

During the study period, 56 open abdominal hysterectomies, 7 laparoscopic-assisted vaginal hysterectomies (of which 2 were converted to open), and 428 vaginal hysterectomies were performed. Of the 428 vaginal hysterectomies, 3 were converted to an open abdominal procedure due to lack of uterine descent secondary to adhesions caused by endometriosis in 2 women and the unexpected finding of a cervical mucinous adenocarcinoma in one woman. These cases were not included in the final analysis. One woman who underwent vaginal hysterectomy had a concomitant laparoscopic left salpingo-oophorectomy. This case was included in the analysis, but was considered an unsuccessful salpingectomy; thus, a total of 425 vaginal hysterectomy cases are reported. The primary indications for hysterectomy included dysfunctional uterine bleeding in 171, prolapse in 104, uterine fibroids in 69, dysmenorrhea in 53, transgender surgery in 12, fear of ovarian cancer in 1, other in 9 and missing data in 6. Some women had more than 1 admitting diagnosis. Uterine weight ranged from 29 to 968 g, including 44 uteri weighing >250 g.

Demographic characteristics of the cohort are described in Table 1. Nine women (2%) had diagnosed breast cancer, and 21 (5%) had a first-degree relative with a history of either breast and/or ovarian cancer. The perioperative data are displayed in Table 2. Concomitant surgeries for prolapse and incontinence were performed in 54 women. The mean

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